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ORIGINAL PAPER

Evaluation of a New Person-Centered Integrated Care Model in Psychiatry

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Abstract The present study evaluated a new integrated treatment concept offering inpatient care, acute psychiatric day hospital and outpatient treatment by the same therapeutic team. 178 patients participated in this randomized controlled trial. Data on psychopathology, global and social functioning, patient satisfaction, continuity of care and administrative data was gathered on admission, throughout the course of treatment, upon discharge and at 1-year follow-up. In addition, the physicians in charge rated the therapeutic relationship. The data analysis consists of group-wise comparisons and regression analyses (cross-tabulations and χ^2 test statistics for categorical data and Mann–Whitney U tests for continuous data). Differences between groups over time were analyzed with a series of generalized linear mixed model. The integrated care group showed a significant reduction in psychopathological impairment (20.7 %) and an improvement of psychosocial functioning (36.8 %). The mean number of days before re-admission was higher in the control group when compared to the integrated care group (156.8 vs. 91.5). There was no difference in the number of re-admissions and days spent in psychiatric institutions. This new approach offers a treatment model, which facilitates continuity of care. Beside it improves psychopathological outcome measures and psychosocial functioning in patients with mental illness.

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Keywords Integrated care · In-patient care · Acute day hospital · Outpatient care · Continuity of psychiatric care

Abbreviations

ACT	Assertive community treatment
AMDP	Arbeitsgemeinschaft für Methodik und Dokumentation in der Psychiatrie
CGI	Clinical global impression
CSQ	Client satisfaction questionnaire
HoNOS	Health of the nation outcome scale
MANSA	Manchester short assessment of quality of life
RSQ	Recovery style questionnaire
SCL-10	Symptom checklist 10
SES	Service engagement scale
STAR	Scale for the assessment of therapeutic relationships
WPA	World Psychiatric Association

Introduction

Mental health services can be described by their in-patient/out-patient split and the degree of continuity of care. But attention should be paid to definitions of continuity of care, which have changed over time. From the 1990s multidimensional concepts (personal, team and cross-boundary continuity) increased and patient's perspective emerged [1, 2]. Hospitals are traditionally organized so as to facilitate the efficient delivery of care, while interpersonal continuity takes a subsidiary place [3].

Recently there has been a highly debated move to separating consultant responsibility in UK mental health services [4]. The split of responsibility for in-patient and out-patient care is a serious problem facing mental health care in Europe [5]. Contrary to this movement, the World Psychiatric Association affirmed the person as a whole within their context as the center and target of clinical and health promotion and called for a care program involving all relevant health and social sciences [6]. At the same time we can observe a movement towards integrated care in former known for their split in healthcare systems. Approaches towards optimized mental health care have been taken on various levels, including effectiveness and specific indications of mental health services [7, 8] with due regard to personnel and financial resources [9]. Previous studies have identified various needs and demands for person-centered care services, among them permeability of the institution [10] and continuity of care [11, 12]. Continuity of care often contrasts with the structures of and boundaries between different mental health care settings and referrals between different facilities remain challenging. Continuity of care is amongst others a dynamic process, influenced by care structures and organizational change [13]. Loss of information and lack of continuity are the main complaints of both patients and staff members in fragmented care systems [11, 14]. Due to lack of evidence-based information on the effectiveness of different settings, specific indications for a given mental health setting are vague.

Research comparing different mental health settings has to be interpreted also in its respective national context, as the effectiveness of a treatment model in one mental health system may not be replicated in another. This was the case for assertive community

treatment (ACT) in the UK [15, 16] when compared to the USA and Australia [17, 18]. As reviewed by Brenner et al. [19] all settings have their particular advantages and disadvantages, strengths and weaknesses. When comparing e.g. inpatients to a day hospital group, social and clinical outcomes were similar at 12 months, but inpatients improved significantly faster than day patients at two and four weeks after admission [20].

The aim of this study is to examine a model of integrated care regarding a combination of personal continuity, team continuity and cross-boundary continuity in an acute psychiatric setting.

First of all, we expected the intervention group, treated according to this new model of integrated care in mental health (MIC), to have a significantly shorter duration of inpatient stay than the control group receiving standard inpatient treatment. Second, there is no difference between the intervention and the control group concerning the number of re-admissions. Third, patients and staff members in the intervention group are more satisfied in comparison to the control group.

Method

The Model

The most prominent feature of the new 'model of integrated care in mental health' (MIC) is a single multidisciplinary team offering a spectrum of different care settings ranging from inpatient care over acute day hospital treatment to outpatient care. Changes can be bidirectional, i.e. patients can move in both more as well as less intense settings and remain in the same spatial and personnel context whilst maintaining the therapeutic relationships. It is based on a former inpatient unit and located in the same building as the inpatient units providing standard care. This includes the provision of all up-to-date evidence based diagnostic and therapeutic interventions in psychiatry. Patients in the MIC remain under the care of the same team, ensuring continuity of care. Every patient is allocated to the caseload of one physician who is in charge of coordinating all treatments and serves as a primary contact person. After initial assessment patients are assigned to the most appropriate setting, i.e. either inpatient, day hospital or outpatient care in a shared decision making process. In the further treatment process, they can switch settings according to their individual social and therapeutic needs.

Study Design

A randomized controlled trial was conducted at a hospital with 6 units. One unit was excluded because of its specialized mandate for treatment of mental and behavioral disorders due to psychoactive substance. The remaining units were appropriate for standard treatment without specialization, thereof one with the new integrated care concept (MIC) and four that served as control units (no difference regarding staff, expertise, resources, workloads).

The process of randomization was integrated in the clinical triage process, i.e. the process of a consultant allocating patients admitted to the hospital available beds. The so-called triage consultant was not associated with the trial in any way and randomly allocated patients according to the randomization list (table of random numbers) to avoid selection bias. Randomization was done on patient level according to the number of inpatient units available. There was no further stratification of the sample.

After the randomization the patients got assigned to the unit providing integrated care or to one of the standard care units. The study participants did not have a voice in treatment allocation. Once the participant has consented, the researcher conducted the baseline assessment. Consent to take part in the trial could be withdrawn at any time, without any negative consequences. Clinical treatment was given according to the current subject-specific guidelines (source: national and international psychiatric associations). For each patient, a 1-year follow-up was conducted after discharge to gather information on the further course of treatment. We aimed to recruit 180 service users. This sample size was determined by pragmatic considerations but adequate for the planned analyses. The sample sizes would be sufficient to detect between group effect sizes of 0.4 (a small to medium effect) and above with 90 % power at a 5 % significant level.

Subjects

The study sample comprised individuals admitted to a University Hospital. After discharge from the index stay, patients were followed up for 1 year. Participants had to fulfill the following criteria: any psychiatric diagnosis according ICD-10 except mental and behavioral disorders due to psychoactive substance use (ICD-10 F10–16, 18–19) and organic, including symptomatic, mental disorders (ICD-10 F0), age between 18 and 65 years. Exclusion criteria were pregnancy and incapacity to consent, e.g., due to an acute and severe psychopathological state. All patients who met the inclusion criteria were approached by a research assistant and asked to take part in the study. Eligible participants were required to give written informed consent. Data handling was according to the principles of good clinical practice. All data are stored in line with the Data Protection Act. The local ethics committee has confirmed the study in accordance with the Declaration of Helsinki.

Instruments

Information on psychopathology was gathered with the Arbeitsgemeinschaft für Methodik und Dokumentation in der Psychiatrie (AMDP) rating system [21], clinical global impression rating scales (CGI) [22], health of the nation outcome scales (HoNOS-D) [23–26] and Hopkins Symptom Checklist (SCL-10) [27]. AMDP is a standardized system for the evaluation and documentation of a psychopathological status with higher scores indicating more psychopathological symptoms. The Clinical Global Impression rating scales are commonly used measures of symptom severity and treatment response. The clinical global impression-severity scale (CGI-S) is a seven point scale to rate the severity of the patient's illness at the time of assessment, relative to the physician's previous experience with patients having the same diagnosis. It is rated from '1 = normal' to '7 = extremely ill'. The clinical global impression-improvement scale (CGI-I) is a seven point scale to assess how much the patient's condition improved or worsened relative to the baseline state from the beginning of treatment. It is rated from '1 = very much improved' to '7 = very much worse'. The SCL-10 includes ten items describing common psychiatric symptoms which are rated by five points according to their severity with higher scores indicating more severe symptoms [27]. HoNOS is a 12 item and five point scale developed to assess the health and social functioning of patients with mental disorders [23, 24]. Physicians rated the items from '0 = no problem' to '4 = very severe problem'. Quality of life was assessed by the Manchester short assessment of quality of life (MANSA) [28]. The MANSA is a brief instrument for assessing quality of life focusing on satisfaction with life consisting of 16 items rated by seven points from '1 = very unsatisfied' to '7 = very

satisfied'. Information on the therapeutic relationship was gathered by the scale to assess therapeutic relationships (STAR-D) in both the patient and the clinician version [26, 29]. Statements are rated by five points ranging from '0 = never' to '4 = always'. The scale consists of twelve items and is available in both a patient and a clinician version. Patient satisfaction was covered with the client satisfaction questionnaire (CSQ) [30, 31] in its brief version consisting of eight items and varying four point scales. Higher scores indicate greater satisfaction. To measure recovery, the recovery style questionnaire (RSQ) [32] with 39 items to be denied or accepted was applied. Engagement with services was measured by clinicians with the service engagement scale (SES) [33] and its 14 items rated by four points ranging from 'rarely or never' to 'most of the time'. Patients were asked to complete the SCL-10, MANSA, STAR, CSQ and RSQ. Researchers with staff and residents completed the AMDP, CGI, HoNOS, STAR and SES.

Outcome criteria include length of stay, number and length of re-admissions, overall satisfaction and psychopathology. During evaluation of each patient, data were collected five times as listed in the Table 1.

The time interval between t1 and t2 and t4 and t5 was equal for all patients. The first collection of data (t1) was conducted within 24 h of admission and includes psychopathology according to AMDP and a general assessment of functioning by CGI and HoNOS. During the initial phase of hospitalization (t2), socio-demographic data was added. Moreover, a diagnosis according to ICD-10 [34] and a therapeutic plan were established. The quality of life was rated with MANSA and the therapeutic relationship with STAR. Upon any change of setting (t3) and before discharge (t4), data on psychopathology (AMDP), CGI, SCL-10, HoNOS, client satisfaction, therapeutic relationship, quality of life, recovery style, patient-compliance [35] and patients' service engagement was collected. Moreover, information on the length of stay in inpatient or day care was collected upon discharge. A 1-year-follow-up (t5) was conducted to gather information on number and duration of re-admissions for inpatient and/or day care.

Apart from the patients, their physicians in charge completed a structured interview. The physicians in charge completed the questionnaires on the therapeutic relationship (STAR-C) at the same time the patients (STAR-P) did so. Moreover, data on their caseload and work experience was collected.

Statistical Analysis

Descriptive statistics and group differences in sample characteristics at admission (i.e. study onset) were analyzed with cross-tabulations and χ^2 test statistics for categorical data and Mann–Whitney U tests for continuous data. Differences between groups over time were analyzed with a series of generalized linear mixed model (GLMM). GLMM extend generalized linear models (GLM) by the inclusion of random effects. They constitute a generalization of multilevel linear growth models by allowance of non-normal and categorical outcomes. GLMM are recommended for use with hierarchically nested data structures in which a set of observations (i.e., repeated measures; level-1) is nested within another set of observations (different test subjects; level-2) [36]. A fixed effect is supposed to have values that are the same in every study, that is, categories of fixed effects are clearly defined and thus replicable (e.g. application of a given medicament). In contrast, random effects contain values that may vary randomly because their distinct categories represent a random sample from a larger population (e.g. group of physicians that apply the medicament). Based on a procedure for longitudinal multilevel analysis described by Peugh and Enders [37] we included the intercept and measurement occasion (i.e. time) in

Table 1 Time and type of patient assessment

	Point of time	Assessment	Tests
t_1	Within 24 h after admission	Psychopathology, global functioning	AMDP, CGI, HoNOS
t_2	Within 5 days after admission	Diagnosis, relevant treatment parameters, sociodemographic data	MANSA, STAR
t_3	Transition between settings	Clinical and social functioning	AMDP, CGI, HoNOS, CSQ, STAR, RSQ, SCL-10, Compliance, SES
t_4	Transition to outpatient care	Clinical and social functioning	AMDP, CGI, HoNOS, CSQ, STAR, RSQ, SCL-10, Compliance, SES
t_5	Follow-up 1 year after discharge	Administrative data on readmission and durance of stays	

AMDP assessment and documentation of psychopathology, *CGI* clinical global impression, *CSQ* client satisfaction questionnaire, *HoNOS* health of the nation outcome scale, *MANSA* Manchester short assessment of quality of life, *RSQ* recovery style questionnaire, *SCL-10* symptom checklist 10, *SES* service engagement scale, *STAR* scale for the assessment of therapeutic relationships

our GLMM as fixed and random effects, which meant that intercept and slope were allowed to vary randomly across subjects. In longitudinal analyses, the intercept corresponds to the initial value of the repeated measures and the slope corresponds to the linear growth rate of those measures (i.e., linear time-trend). We included the following predictors: time (level-1 covariate; within-subject effect), treatment group (level-2 covariate; between-subject effect), and an interaction effect between time and intervention (cross-level covariate). The covariance structure for the random effects was specified with the variance-components type. Distribution and link-function of the dependent variables were fitted according to their measurement level, variance and dispersion. For the CGI we fitted a binomial distribution with probit link-function; for the AMDP and the HoNOS a normal distribution with log link-function; for the MANSA, STAR clinician- and self-rating a gamma distribution with log link-function. Measures that were assessed only at discharge or at follow-up, respectively, were analyzed with a series of GLM. Again, the intercept was included in all models. All rating-scale measures at discharge were fitted with a gamma distribution and log-link function. All measures at follow-up were over-dispersed count variables and were thus fitted with a negative binomial distribution with log link-function. Statistical significance was based on the test of model effect for treatment group. GLM assessing effectiveness of integrated care at discharge and at 1-year follow-up was adjusted for baseline psychopathological and social functioning impairment at admission.

Results

For enrolment and allocation please see Fig. 1. Descriptive statistics of baseline sample characteristics at admission are reported in Table 2. The study sample comprises 55 % women (44 % in the general study site population with similar characteristics as the study inclusion criteria; N = 1,772), 59 % single, 21 % married (study site 54 % and 18 % resp.). The diagnoses according to ICD-10 main categories were distributed as follows: F2 (psychotic disorders) 45 %, F3 (mood disorders) 28 %, F4 (neurotic, stress-related and somatoform disorders) 19 %, F6 (disorders of adult personality and behaviour) 8 % (study site distribution: F2—48 %, F3—26 %, F4—14 %, F6—12 %). Mean age of the study sample was 40 years (study site 44 years). There were significant group differences with respect to CGI ($p < 0.05$), AMDP ($p < 0.01$) and HoNOS ($p < 0.05$). That is, psychopathological and social functioning impairment at admission were higher in the integrated care group than in the control group.

Over the hospitalization period (time from admission to discharge from inpatient or day care) we observed significant changes in various outcome measures that we were able to associate to the integrated care intervention (see Table 3). With respect to psychopathological (CGI and AMDP) and psychosocial (HoNOS) impairment we found a significant effect of time, that is, independent of treatment group, impairment significantly decreased over the hospitalization period. The proportional decrease in CGI, AMDP, and HoNOS was 21.8, 67.0, and 19.5 % respectively. This indicates that the treatment provided in both groups was effective in reducing distress and impairment. The integrated care group yielded positive associations with CGI, AMDP, and HoNOS, i.e. subjects in the integrated care group showed on average a higher impairment on these measures over time. This is a consequence of the lower initial impairment scores in the control group at admission and must not be relied to the effectiveness of the integrated care model (see also Table 2). Most importantly, the interaction-effect between time and integrated care yielded significant negative associations, which indicates that patients in the intervention group showed a

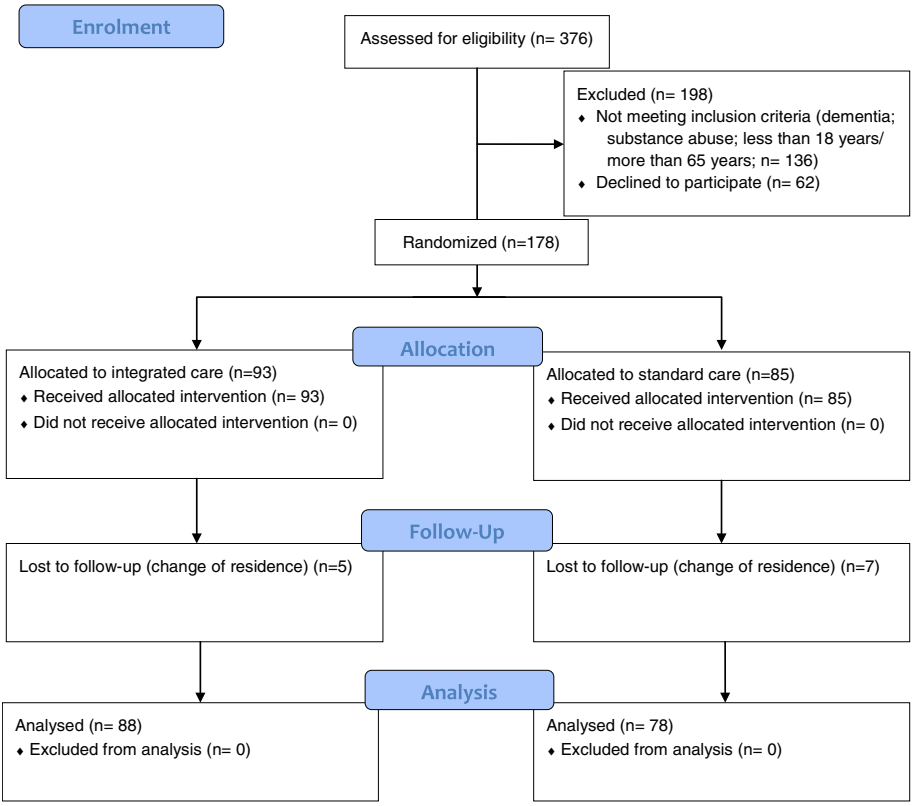

Fig. 1 Patient flow diagram

more pronounced decline in psychopathological and social functional impairment over the hospitalization period than subjects in the control group. That is, with respect to CGI, AMDP, and HoNOS the integrated care model is more effective than the standard treatment procedure. Compared to the control group, in the intervention group the reduction in impairment according to CGI, AMDP, and HoNOS was 9.6, 20.7, and 36.8 %. Independent of the treatment group we found only a significant positive effect of time for the MANSA, which means that quality of life increased over the hospitalization period by 12.0 %. That means that the integrated care could not improve quality of life beyond the standard treatments. There are no significant associations between clinicians' and patients' ratings of the STAR scale.

Indices of patient psychopathology, recovery, and service engagement at discharge from the hospital did not differ between the groups (see Table 4). In this respect the integrated model was not superior to the standard treatment. The CSQ revealed a trend towards statistical significance, indicating that patients of the integrated care group were slightly more satisfied with their treatment than patients of the control group.

The dropout rate in the follow-up observation period was low. Follow-up outcomes were not available for only 12 patients out of 178 (6.7 %). Analyses of clinical characteristics (i.e. age at admission, duration of hospitalization, CGI, AMDP, HoNOS, MANSA, and STAR) at outset of the study revealed that dropouts did not differ from the remaining

Table 2 Baseline descriptive statistics and group-wise comparisons at admission

	Control group	Integrative care
Sex		
Female	34 (40 %)	46 (49 %)
Male	51 (60 %)	47 (51 %)
Civil state		
Single	50 (60 %)	53 (57 %)
Married	17 (20 %)	19 (21 %)
Separated/divorced	15 (18 %)	19 (21 %)
Widowed	2 (2 %)	1 (1 %)
Diagnosis (ICD-10)		
F2	39 (46 %)	41 (44 %)
F3	23 (27 %)	27 (29 %)
F4	18 (21 %)	15 (16 %)
F6	5 (6 %)	10 (11 %)
Age (years)	38.75 (11.56)	41.53 (11.86)
CGI* total score	5.52 (1.02)	5.93 (0.77)
AMDP** mean score	0.258 (0.142)	0.335 (0.161)
HoNOS* mean score	1.731 (1.040)	2.087 (0.841)
MANSA mean score	3.832 (1.234)	3.768 (1.059)
STAR clinician rating	3.091 (0.400)	3.119 (0.420)
Self-rating	2.988 (0.687)	2.953 (0.580)

Categorical data are indicated with N (% within group) and continuous data with mean (standard deviation)

* $p < 0.05$ ** $p < 0.01$

Table 3 Effectiveness of the new model of integrated care (MIC): psychopathological distress and social functioning over hospitalization period as estimated with GLMM

Outcome	Parameter	β (SE)	p value
CGI total score (N = 173)	Time	−0.197 (0.025)	0.000
	Integrated care	0.081 (0.025)	0.002
	Time × integrated case	−0.092 (0.034)	0.008
AMDP mean score (N = 160)	Time	−0.513 (0.054)	0.000
	Integrated care	0.195 (0.054)	0.000
	Time × integrated case	−0.188 (0.075)	0.013
HoNOS mean score (N = 164)	Time	−0.178 (0.044)	0.000
	Integrated care	0.109 (0.047)	0.021
	Time × integrated case	−0.313 (0.069)	0.000
MANSA mean score (N = 124)	Time	0.113 (0.039)	0.005
	Integrated care	0.001 (0.052)	0.988
	Time × integrated case	0.042 (0.048)	0.383
STAR clinician rating (N = 162)	Time	0.006 (0.016)	0.727
	Integrated care	0.009 (0.020)	0.640
	Time × integrated case	0.023 (0.021)	0.285
STAR self-rating (N = 118)	Time	−0.016 (0.032)	0.618
	Integrated care	−0.005 (0.037)	0.890
	Time × integrated case	0.050 (0.043)	0.254

Table 4 Effectiveness of the new model of integrated care (MIC): psychopathological distress, recovery, and treatment satisfaction at discharge from hospital as estimated with GLM

Outcome	Group	Mean (SE)	p value
Duration of hospitalization (N = 178)	Standard treatment	32.76 (2.539)	0.517
	Integrated care	30.70 (1.946)	
CSQ mean score (N = 129)	Standard treatment	3.164 (0.072)	0.093
	Integrated care	3.321 (0.058)	
SCL-10 mean score (N = 126)	Standard treatment	1.424 (0.117)	0.669
	Integrated care	1.357 (0.098)	
SES mean score (N = 163)	Standard treatment	0.746 (0.063)	0.379
	Integrated care	0.677 (0.045)	
RSQ total score (N = 113)	Standard treatment	60.515 (2.949)	0.829
	Integrated care	61.381 (2.466)	

sample. However, indices for long-term effectiveness of the integrated care model revealed that at follow-up only the number of days before re-admission was significantly related to the integrated care group. Control group patients were on average more than 2 months (65.35 days) later re-hospitalized than patients from the integrated care group (see Table 5).

Discussion

The main hypothesis, that the integrated care group would have a significantly shorter duration of inpatient stay than the control group, was refuted. But in contrast to the findings described before [38, 39] the acute day care part of our integrated model didn't lead to an increased length of stay. We also found a significant reduction in psychopathology and a significant improvement of psychosocial functioning in the intervention group. This might be explained by the continuity of care and thereby the constant therapeutic relationship. Continuity of care could lead to a better adherence to the therapeutic and psychosocial interventions and thus reduce symptom load and number of disease episodes over time.

Our second hypothesis can be confirmed, there was no difference with respect to re-admission and days spend in inpatient and outpatient institutions. Regarding the follow-up analysis the integrated care group showed a less delayed psychiatric re-referral, which may be due to a less delayed help-seeking behavior. We could not find a significant longer duration of inpatient stay or a raise in number and/or length of re-admission in the intervention group. The participants maintained the same time in their communities.

A continuous therapeutic relationship may lower the patients' threshold for seeking professional help. Integrated care models can be helpful for a better orientation in the "jungle of care providers" and due to the continuity in therapeutic relationship might be more engaging for both, patients and professionals.

The patients from the integrated care group showed a trend to be more satisfied with their treatment than patients from the control group. This is in line with the findings that patients in day treatment with outpatient and outreach care and their families were significantly more satisfied with the treatment received than those receiving standard clinical care [40].

Table 5 Effectiveness of the new model of integrated care (MIC): number of re-admission and days under treatment at 1-year follow-up after discharge estimated with GLM

Outcome	Group	Mean (SE)	P value
Number of re-admissions in inpatient institutions (N = 166)	Standard treatment	0.38 (0.074)	0.191
	Integrated care	0.55 (0.124)	
Number of re-admissions in outpatient institutions (N = 166)	Standard treatment	0.09 (0.035)	0.688
	Integrated care	0.07 (0.030)	
Number of ambulatory treatments (N = 166)	Standard treatment	0.22 (0.066)	0.171
	Integrated care	0.35 (0.062)	
Number of hospitalized days in inpatient institutions (N = 166)	Standard treatment	10.34 (2.398)	0.765
	Integrated care	9.39 (2.170)	
Number of hospitalized days in outpatient institutions (N = 166)	Standard treatment	4.54 (1.802)	0.851
	Integrated care	5.11 (3.041)	
Number of days before re-admission (N = 56)	Standard treatment	156.82 (22.795)	0.046
	Integrated care	91.47 (20.023)	

The call for a permeable institution has been strong ever since Goffman's *Asylums* [41] and brought about the process of deinstitutionalization. Features of a permeable institution include (a) ward membership being temporary or revolving, (b) maintained contact with the outside world and (c) the blurring of institutional identities [10]. Permeability of an institution has an impact on the continuity of care as well.

Continuity of care, however, has not yet been defined exactly. Burns et al. confirm previous findings that continuity of care comprises more than one single entity [11]. In various studies examining the concept, continuity of care was found to comprise 'sustained patient-physician partnerships' [42]; maintenance of contact, consistency in the member of staff seen and success of transfer between services [43]. Better overall continuity was found to be associated with better quality of life, better community functioning, lower symptom severity and greater service satisfaction in patients with severe mental illness [14]. We could confirm these findings with regard to better social functioning, lower symptom severity and greater service satisfaction. The MIC facilitates some of the recognized entities of 'continuity of care'. It comprises e.g. stable therapeutic relationship, reduced loss of information due to avoidance of split responsibility and consistent approach to the management of health condition; therefore it seems useful to provide continuity of care. In addition it allows to consider the illness experience and to integrate new information from the whole person efficiently. This more person-centered therapeutic offer shows a long term-effectiveness. The new MIC could complement the community based models, e.g. ACT by offering a more institutionalized setting for those benefitting from it. ACT was developed in the 1970 s in context of closing down of psychiatric hospitals (Madison model). This team based approach is a clinical effective approach to managing the care of severely ill people in the community by improving outcome and patient satisfaction from high users of in-patient care [44].

Also in comparison to pure acute psychiatric day hospitals [45], which are as effective as inpatient care [46], the integrated care model as described above could be an enrichment in psychiatric care. Marshall et al. [46] conclude that there was moderate evidence that the duration of index admission is longer for patients in day hospital care than inpatient care, very low evidence that the duration of day patient care is longer than inpatient care and that there is no difference for being readmitted to in-/day-patient care after discharge. They also pointed out that it is likely that there is no difference for being unemployed, for quality of life and for treatment satisfaction [46].

Some mental health services generally tend to separate consultant responsibility for inpatient and out-patient care with the potential disadvantages. Competition between different care approaches in the national context may lead to the development of new and improvements of existing "care models". This new model does, however, confer some risks due to its flexibility. It could be demanding for staff members, although we could not find any group difference in satisfaction of staff members (data not shown). Switches between different work styles in different settings (short-term management of acute symptoms vs. long-term management including psychosocial aspects) and a varying number of patients are challenging and require good capacities and great adaptability. On the other hand, if patients' needs are met more promptly and in a clinical effective manner, work in an integrated care model could raise also staffs' satisfaction. For implementation in different contexts the respective resources, therapeutic traditions and costs need to be considered carefully.

These results should be interpreted in the light of following limitations. First, we have a group difference regarding the psychopathology and the social functioning, with higher scores in the integrated care group, at admission. The integrated care model showed led to

a stronger decline in psychopathology and social functioning than the standard treatment group. Differences between groups were analyzed with a series of generalized linear mixed models. This way of testing is comparable to adjusting outcomes for baseline values [47]. The results have not been affected by the mentioned differences. We have to note that the study was randomized but not blinded; this could have led to biased assessment by research staff that performed the evaluation. Blinding of patients and care providers to preserve performance bias was not possible. Since the dropout rate in the follow-up period was low and the dropouts did not differ from the remaining sample attrition bias should be negligible. The included patients did not differ from the clinical population in terms of gender, age, and diagnose. The number of participants dealt with in the intervention unit is four times higher than any of the control units. This could have an impact on the reported outcomes. The involved units offered standard treatment to all patients independent of their participation in the study. Due to the single site in the intervention arm it is hard to deny a theoretic "site"-effect. Since the control units did not differ significant regarding the potential confounding factors, the potential confounding impact should be small. The standard of living in some countries is extraordinarily high; perhaps greater improvements in the quality of life could be achieved in other settings. A third limitation could concern the observation period. A 1-year-follow-up may fail to capture all the benefits of the new model (MIC). It is likely that, over a follow-up period of several years, the total number of re-admissions in the intervention group will be lower.

The study findings may have some important implications. Given that in continental Europe the strict separation in mental health care is common, permeable models like the integrative care model, described above, may lead to effective person-centered care. Our data indicate that this permeable care model could (a) improve patient satisfaction; (b) have a long-term effectiveness; (c) helps to have less delay in psychiatric help-seeking behavior.

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